Group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_            [Name/No. of the group conducting the evaluation]

**Activity 1: Testing the power output**

1. Place your solar charger in a well-lit area that receives direct sunlight. Ensure the solar panel receives sunlight.
2. Connect the phone with the charging cable.
3. Open the app on your phone.
4. Wait 1-2 minutes, then note the voltage and current readings.
5. Each student from each group is to take one reading using their phone.

 *Note: Students can use their flashlights if the sun is not out.*

| **Test No.**  |  **Voltage (V)** | **Current (mA)** | **Power (W)** |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

Answer the following questions based on your power testing results:

1. Does the actual power rating of your solar charger match the calculated power output? If not, why do you think there is a difference between the two?

|  |
| --- |

1. Are there any external factors or environmental conditions that affect the power output of your solar charger? Consider variables such as temperature, humidity, and dust accumulation, and explain their potential influence on power output.

|  |
| --- |

**Activity 2: Efficiency (compared to a regular charger) testing**

Instructions

1. Set up your solar lamp in a well-lit area that receives direct sunlight. Ensure the solar panel is positioned towards the sun.
2. Observe the initial battery percentage of the phone.
3. Connect the phone with the solar charger through the USB cable.
4. Note down the time taken to increase the battery percentage by 2%
5. Connect the phone to the regular charger. Note down the time taken to improve the battery percentage by 2%

| **Test No.**  | **Solar charger Charging Time (minutes)**  | **Regular Charger Charging Time (minutes)** | **Time Difference (minutes)** |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |

Answer the following questions based on your power testing results:

1. Did you observe a significant difference in the charging times between the solar lamp and the regular charger?

|  |
| --- |

1. Discuss the potential reasons for the difference in charging times between the solar lamp and the regular charger.

|  |
| --- |

1. Reflecting on the charging time comparison, what are the advantages of using a solar lamp in terms of convenience and portability?

|  |
| --- |

**Activity 3: Portability testing**

**Size and Weight:**

1. Estimate the size and weight of your solar charger using a relative scale of small, medium, or large and light, moderate, or heavy. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Explain your estimation and describe specific features or components contributing to size and weight.

|  |
| --- |

**Compact Design:**

1. Does your solar charger have a folding or compact design that enhances portability? \_\_\_\_\_\_\_\_
2. Describe the folding mechanism or compact features and explain how they make the solar charger more convenient to carry or store.

|  |
| --- |

**Activity 4: Affordability**

Evaluate the affordability of your solar charger by considering the materials used in its construction and their associated costs. Fill in the table below with the appropriate information.

|  **Material** **Used** | **Cost in $** |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

$10 - $15: Cheap $16 - $25: Affordable $26 - $35: Expensive

**Activity 5: Reflections and Improvement**

1. Did your solar lamp meet the design specifications? How do you know your group has met these design specs?

Fill in the table below.

| **Design Specification** | **Description** | **Met design spec? (Y/N)** | **How have we met the design specification?** |
| --- | --- | --- | --- |
| Power Output | The solar charger should provide an optimal power output to charge electronic devices efficiently. |  |  |
| Portability | The solar charger should be designed to be lightweight and portable, allowing easy transportation during camping activities. |  |  |
| Charging Ports and Compatibility | The solar charger should feature compatible ports and connectors to accommodate a range of electronic devices. |  |  |
| Durability | The solar charger should be built to withstand outdoor conditions and be resistant to water, dust, and other environmental factors. |  |  |
| Cost-Effectiveness | The solar charger should be designed to be cost-effective |  |  |

2. Does your solar charger require modification?

|  |
| --- |

3. Rate the necessary level of change for each criterion (power output, efficiency, portability, affordability) in your solar lamp modification plan.

| **Criteria** | Level 1 (Minimal Change)  | Level 2 (Moderate Change) | Level 3 (Significant Change) |
| --- | --- | --- | --- |
| **Power output** |  ☐ |  ☐ |  ☐ |
| **Portability** |  ☐ |  ☐ |  ☐ |
| **Affordability** |  ☐ |  ☐ |  ☐ |

4. If modifications are required, elaborate on how your group plans to make these changes.

| **Criteria** | **Improvement ideas** | **Implementation plan** |
| --- | --- | --- |
| **Power output** |  |  |
| **Portability** |  |  |
| **Affordability** |  |  |

*Note: Look around for groups that excel in either of the criteria.*